

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-20 (canceled).

Claim 21 (new): A method for detecting a target sound, comprising the steps of:
inputting sounds output from a sound source into plural microphones;
detecting a phase of a cross-spectrum between sound signals input into the plural microphones;
detecting an inclination of the phase of the cross-spectrum with respect to a frequency due to respective distances from the sound source to the plural microphones;
and
based on the inclination, determining whether the sound input into the plural microphones includes the target sound.

Claim 22 (new): The method according to Claim 21, wherein the target sound is human speech.

Claim 23 (new): The method according to Claim 21, further comprising the steps of:
dividing the frequency into a plurality of bands;
detecting the inclination of the phase for each of the plurality of bands; and
based on the detected inclinations of the phase of each of the plurality of bands, determining whether the sound input into the plural microphones includes the target sound.

Claim 24 (new): The method according to Claim 23, further comprising the steps of:

generating a histogram based on the detected inclinations of the phase of each of the plurality of bands; and

detecting an incidence from the histogram to determine whether the sound input into the plural microphones includes the target sound.

Claim 25 (new): The method according to Claim 23, further comprising the step of:

detecting the target sound when the detected inclinations of each of the plurality of bands are concentrated near a specific inclination.

Claim 26 (new): The method according to Claim 21, further comprising the steps of:

dividing the sound signals input into the plural microphones into predetermined time sections; and

detecting the phase of the cross-spectrum between the sound signals in each time section.

Claim 27 (new): The method according to Claim 21, wherein the plural microphones include at least two microphones adapted to be mounted in different positions.

Claim 28 (new): The method according to Claim 21, further comprising the step of, based on the inclination, detecting a delay time in signals input into the plural microphones from the sound source.

Claim 29 (new): A method for determining a delay time in signal input, comprising the steps of:

inputting sounds output from a sound source into plural microphones;
detecting a phase of a cross-spectrum between sound signals input into the plural microphones;
detecting an inclination of the phase of the cross-spectrum with respect to a frequency due to respective distances from the sound source to the plural microphones;
and
based on the inclination, determining the delay time in signal input of the sounds input into the plural microphones from the sound source.

Claim 30 (new): The method according to Claim 29, wherein in the step of determining the delay time, a predetermined modal inclination is used to determine the delay time.

Claim 31 (new): The method according to Claim 29, further comprising the steps of:

based on the determined delay time, synthesizing the sounds input into the first and second microphones; and
determining whether a target sound is present in the synthesized sound signals.

Claim 32 (new): The method according to Claim 31, wherein the target sound is human speech.

Claim 33 (new): The method according to Claim 31, further comprising the steps of:

dividing the frequency into a plurality of bands;
detecting the inclination of the phase for each of the plurality of bands; and
based on the detected inclinations of the phase of each of the plurality of bands, determining the delay time.

Claim 34(new): The method according to Claim 33, further comprising the step of:

determining the delay time when the inclinations of each of the plurality of bands are concentrated near a specific inclination.

Claim 35 (new): The method according to Claim 31, further comprising the steps of:

dividing the sound signals input into the plural microphones into predetermined time sections; and

detecting the phase of the cross-spectrum between the sound signals in each time section.

Claim 36 (new): A sound signal processor, comprising:

a cross-spectrum phase detector for detecting a phase of a cross-spectrum between sound signals input into plural microphones;

an inclination detector for detecting an inclination of the phase of the cross-spectrum detected by the cross-spectrum phase detector with respect to a frequency; and

a target sound detector for detecting whether the sound input into the plural microphones includes a target sound based on the inclination with respect to the frequency detected by the inclination detector.

Claim 37 (new): The sound signal processor according to Claim 36, wherein the target sound is human speech.

Claim 38 (new): The sound signal processor according to Claim 36, wherein the inclination detector divides the frequency of the phase of the cross-spectrum into a plurality of bands and detects inclinations of each of the plurality of bands, and the target sound detector detects whether the sound input into the plural microphones

includes the target sound based on the inclinations of each of the plurality of bands detected by the inclination detector.

Claim 39 (new): The sound signal processor according to Claim 38, further comprising a histogram generator for generating a histogram based on the inclinations of the phase of each of the plurality of bands detected by the inclination detector, wherein the target sound detector detects an incidence from the histogram to determine whether the sound input into the plural microphones includes the target sound.

Claim 40 (new): The sound signal processor according to Claim 38, wherein the target sound detector detects the target sound when the inclinations of each of the plurality of bands are concentrated near a specific inclination.

Claim 41 (new): The sound signal processor according to Claim 36, wherein the inclination detector divides the sound signals input into the plural microphones into predetermined time sections and the target sound detector detects the phase of the cross-spectrum between the sound signals in each time section.

Claim 42 (new): The sound signal processor according to Claim 36, wherein the plural microphones include at least two microphones adapted to be mounted in different positions.

Claim 43 (new): The sound signal processor according to Claim 36, wherein the target signal detector detects a delay time in signals input into the plural microphones.

Claim 44 (new): A sound signal processor for processing a sound output from a sound source and input into plural microphones, comprising:

a cross-spectrum phase detector for detecting a phase of a cross-spectrum between sound signals input into the plural microphones;

an inclination detector for detecting an inclination of the phase of the cross-spectrum detected by the cross-spectrum phase detector with respect to a frequency;

a delay time detector for detecting a delay time in the sound signals input into the plural microphones based on the inclination with respect to the frequency detected by the inclination detector.

Claim 45 (new): The sound signal processor according to Claim 44, further comprising a sound signal synthesizer for synthesizing the sound signals input into the plural microphones based on the delay time detected by the delay time detector.

Claim 46 (new): The sound signal processor according to Claim 45, further comprising a target sound detector for determining whether a target sound is present in the synthesized sound signals.

Claim 47 (new): The sound signal processor according to Claim 46, wherein the target sound is human speech.

Claim 48 (new): The sound signal processor according to Claim 44, wherein the inclination detector divides the phase of the cross-spectrum into to a plurality of bands and detects inclinations of each of the plurality of bands, and the delay time detector detects the delay time based on the inclinations of each of the plurality of bands detected by the inclination detector.

Claim 49 (new): The sound signal processor according to Claim 47, wherein the delay time detector detects the delay time when the inclinations of each of the plurality of bands are concentrated near a specific inclination.

Claim 50 (new): The sound signal processor according to Claim 47, wherein the inclination detector divides the sound signals input into the plural microphones into

predetermined time sections and the delay time detector detects the delay time based on the cross-spectrum between the sound signals in each time section.

Claim 51 (new): The sound signal processor according to Claim 44, wherein the plural microphones include at least two microphones adapted to be mounted in different positions.

Claim 52 (new): A voice recognition device for processing a speech sound output from a speech sound source and input into plural microphones, comprising:

- a cross-spectrum phase detector for detecting a phase of a cross-spectrum between sound signals input into the plural microphones;

- an inclination detector for detecting an inclination of the phase of the cross-spectrum detected by the cross-spectrum phase detector with respect to a frequency;

- a speech sound detector for detecting whether the sound signals input into the plural microphones includes the speech sound based on the inclination with respect to the frequency detected by the inclination detector; and

- a voice recognition processor for performing voice recognition processing of the speech sound detected by the speech sound detector.

Claim 53 (new): The voice recognition device according to Claim 52, wherein the inclination detector divides the frequency of the phase of the cross-spectrum into a plurality of bands and detects inclinations of each of the plurality of bands; and

the speech sound detector detects whether the sound signals input into the plural microphones includes the speech sound based on the inclinations of each of the plurality of bands detected by the inclination detector.

Claim 54 (new): A voice recognition device for processing a speech sound output from a speech sound source and input into plural microphones, comprising:

a cross-spectrum phase detector for detecting a phase of a cross-spectrum between sound signals input into the plural microphones;

an inclination detector for detecting an inclination of the phase of the cross-spectrum detected by the cross-spectrum phase detector with respect to a frequency;

a delay time detector for detecting a delay time in the sound signals input into the plural microphones based on the inclination with respect to the frequency detected by the inclination detector;

a sound signal synthesizer for synthesizing the sound signals input into the plural microphones based on the delay time detected by the delay time detector;

a speech sound detector for detecting whether the synthesized sound signals synthesized by the sound signal synthesizer include the speech sound based on the inclination with respect to the frequency detected by the inclination detector; and

a voice recognition processor for performing voice recognition processing of the speech sound detected by the speech sound detector.

Claim 55 (new):. The voice recognition device according to Claim 54, wherein the inclination detector divides the phase of the cross-spectrum into a plurality of bands and detects inclinations of each of the plurality of bands;

the delay time detector detects the delay time based on the inclinations of each of the plurality of bands detected by the inclination detector; and

the speech sound detector detects the speech sound based on the inclinations of each of the plurality of bands detected by the inclination detector.

Claim 56 (new): A program for making a computer perform a process of detecting a target sound, the process comprising the steps of:

inputting sounds output from a sound source into plural microphones;

detecting a phase of a cross-spectrum between sound signals input into the plural microphones;

detecting an inclination of the phase of the cross-spectrum with respect to a frequency due to respective distances from the sound source to the plural microphones;
and

based on the inclination, determining whether the sound input into the plural microphones includes the target sound.

Claim 57 (new): A program for making a computer perform a process of detecting a delay time in sound input, the process comprising the steps of:

inputting sounds output from a sound source into plural microphones;
detecting a phase of a cross-spectrum between sound signals input into the plural microphones;
detecting an inclination of the phase of the cross-spectrum with respect to a frequency due to respective distances from the sound source to the plural microphones;
and
based on the inclination, determining a delay time in signals input into the plural microphones.